REMARKS

The above amendments have been made to correct typographical errors appearing in the specification as filed. Applicants submit that no new matter has been entered.

Pursuant to 37 CFR § 1.121, attached as an appendix is a marked version of the above amendments showing the changes that have been made.

Respectfully submitted,

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Date 1/17/03 Jane C. Wirszyla

Additions to the specification are indicated by underlining while deletions to the specification are indicated by brackets, as indicated below. Where the modification involves underlining the original text, the addition is indicated by double underlining.

In the Specification:

At page 3, line 27 to page 4, line 2:

We have now found the activity and stability of [poly(2-propanol, 2-propenoic acid)] poly(2-propenal, 2-propenoic acid) polymers are substantially increased if they are reacted with an alcohol or polyol to form protected carbonyl groups such as acetal and/or hemiacetal derivatives. Surprisingly we have found that the activity of the derivative is substantially increased notwithstanding that the free acrolein content may be extremely low or negligible in the polymer in water. The solubility of the polymer is also very high.

At page 4, lines 25-26:

The invention further provides compositions of the antimicrobial for use as antiseptics, [disinfectant] disinfectants and in treatment of gastrointestinal disease.

At page 4, lines 29-33:

The antimicrobial of the invention may be prepared by heating poly(2-propenal, 2-propenoic acid) in the presence of the alcohol, preferably a polyol such as polyethylene glycol[)]. Water is invariably present in the alcohols and it will be understood that the presence of at least some water assists in the nucleophilic reaction resulting in hemiacetal or acetal formation.

At page 7, lines 4-12:

The poly(2-propenal, 2-propenoic acid) will generally contain no more than 10% on a molar basis of monomer units from monomers other than acrolein and is most preferably an acrolein homopolymer (before autoxidation). Where used other monomers may be selected from the group consisting of acrylic acid and vinyl pyrolidone. The 2-propenoic

acid groups are typically present in the amount of from 0.1 to 5 moles of carboxyl groups per kilogram. The poly(2-propenal, 2-propenoic acid) polymers typically have a number average molecular weight of over 1000 and most preferably over 2000. Typically the molecular weight is less than 10,000.

At page 8, line 32 through page 9, line 2:

We have found that the antimicrobial of the invention has significantly improved activity in controlling gastrointestinal disease when compared with the poly(2-propenal-2-propenoic acid) from which it is prepared. The superactivated derivative of the present invention may be used to treat a wide range of animals (including humans) and a wide range of microbial infections.

At page 9, line 31 through page 10, line 7:

We have found the antimicrobial of the invention to be effective against a wide range of microbes including protozoa, Gram positive bacteria and Gram negative bacteria. Of the Gram negative bacteria the antimicrobial of the invention has been found to provide broad spectrum activity against coliforms or Enterobacteria. It is particularly useful in treatment of gastrointestinal diseases resulting from [*E. coli*] infection [from] by E. coli such as [enteroloxigenic] enterotoxigenic E. coli and β-haemolytic *E. coli*. Colibacillosis is a devastating disease in the pig-rearing industry. The disease is generally associated with proliferation of β-haemolytic *E. coli*[.] in the small intestine after weaning and gives rise to high mortality rates and morbidity rates in young weaner piglets and as a result, failure to make normal weight gains.

At page 10, lines 24-29:

[Clostria] Clostridia are Gram positive bacteria responsible for serious disease in a range of animals. For example, necrotic enteritis is a disease known to affect commercial poultry. Clostridia [bacterial] produce exotoxins which are some of the most toxic of all known toxins. Necrotic enteritis particularly effects broilers of between 14 and 42 days of age. The condition causes pronounced apathy, diarrhoea and can cause death within hours.

At page 11, lines 18-25:

In a preferred embodiment the concentrated composition of the antimicrobial is in a controlled-release form. The controlled release form will include the antimicrobial and a polymeric material for providing controlled release of the antimicrobial from the controlled-release [systems] system and is particularly useful in compositions for addition to solid feed material. As a result of the controlled release formulation the release of the antimicrobial may be delayed so as to occur mainly in the duodenum. A controlled release polymer may also minimise rejection of the composition due to taste or be used for rectal suppositories.

At page 13, lines 16-34:

Solid forms for oral or rectal administration may contain pharmaceutically or veterinarally acceptable binders, sweeteners, disintegrating agents, diluents, flavourings, coating agents, preservatives, lubricants and/or time delay agents. Suitable binders include gum acacia, gelatine, corn starch, gum tragacanth, sodium alginate, carboxymethylcellulose or polyethylene glycol. Suitable sweeteners include sucrose, lactose, glucose or [flavanone] flavonoid glycosides such as neohesperidine dihydrochalcone. Suitable disintegrating agents include corn starch, methylcellulose, polyvinlypyrrolidone, xanthan gum, bentonite, alginic acid or agar. Suitable diluents include lactose, sorbitol, mannitol, dextrose, kaolin, cellulose, calcium carbonate, calcium silicate or dicalcium phosphate. Suitable flavouring agents include peppermint oil, oil of wintergreen, cherry, orange or raspberry flavourings. Suitable coating agents include polymers or copolymers of acrylic acid and/or methacrylic acid and/or their esters, and/or their amides, waxes, fatty alcohols, zein, shellac or gluten. Suitable preservatives include sodium benzoate, vitamin E, α-tocopherol, ascorbic acid, methyl parabens, propyl parabens or sodium bisulphate. Suitable lubricants include magnesium stearate, stearic acid, sodium oleate, sodium chloride or talc. Suitable time delay agents include glyceryl monostearate or glyceryl distearate.

At page 15, lines 8-17:

In this application the antimicrobial composition of the invention may comprise further components. An antiseptic composition of the invention may be in the form

of a lotion or product for washing such as a skin cleaner, soap bar or the like. Lotions are compositions which smooth or moisturize the skin. Lotions will preferably include an emollient. Examples of emollients include polyhydric alcohols such as glycerin, sorbitol, mannitol and propylene glycol and its homopolymers; fatty acid esters of monohydric alcohols such as isopropyl palmitate, isopropyl myristate and similar esters; polyol esters of fatty acids, ethoxylated lanolins, vegetable oils, mineral oils. Such compounds will be known to [formulator] formulators of cosmetics.

At page 16, lines 18-22:

Examples of non-ionic surfactants include but are not limited to alkyl polyglycosides, alcohol ethoxylates such as fatty alcohol ethoxylates and/or propoxylates, alkyl phenolethoxylates, glycol ester surfactants, PEG(20) sorbitan monooleate, polyethylene glycol cocoate, propylene oxide/ethylene oxide block polymers, [akanolamines] alkanolamines, and so forth.

At page 18, lines 16-19:

Examples of suitable isothiazolinones include 2-alkyl-4-isothiazoline-3-ones. Preferred isothiazolinones include 2-(n-octyl-4-isothiazolin-3-one), 4,5-dichloro-2-cyclohexyl-3-isothiazolinone, 4,5-dichloro-2-(n-octyl-4-isothiazolin-3-one), 5-chloro-2-methyl-4-isothiazolin-3-one, and 2-methyl-4-isothiazolin-3-one[,].

At page 18, lines 30-32:

The antimicrobial is useful with sunscreen agents such as aminobenzoates, salicylates, benzophenones, [anthrasilates] anthranilates, dibenzoylmethanes and camphor derivatives.

At page 20, lines 15-18:

Henceforth, the process of providing increased [antimicrobiological] antimicrobial activity by the formation of a new configuration of the subject polymers

including poly(2-propenal, 2-propenoic acid), is referred to as "super-activation" and the polymers referred to as "super-activated polymers".

At page 21, line 33 to page 22, line 4:

Dissolve sample with 1% by weight aqueous sodium bicarbonate to obtain the required concentration (unless specified to the contrary, 0.125% by weight [in] <u>of</u> polymer). Weigh 19.9g of diluted sample into a sterile jar and inoculate with 0.1 mL of 10^7-10^8 cfu of *Ps.aeruginosa* and mix. At specified time-intervals, transfer 1 mL of inoculated sample to 9 mL of Letheen broth and vortex. Plate out serial 1 in 10 dilutions. Pour with trypticase soy agar. Incubate 3 days at 37°C.

At page 22, lines 7-14:

The example describes a method of preparing [a] poly(2-propenal, 2-propenoic acid) by oxidation of a solid acrolein polymer in air. This poly(2-propenal, 2-propenoic acid) is the preferred method of preparing a starting material for use in the method of the invention. Water (720 mL at ambient temperature, about 20°C) and acrolein (60g; freshly distilled, plus hydroquinone added to 0.25% w/w) were placed in an open beaker, within a fume cupboard, and very vigorously stirred, mechanically. Then, 0.2 M aqueous sodium hydroxide (21.4 mL) was added to bring the pH to 10.5-11.0.

At page 26, lines 3-5:

(a) 5% w/w solutions of polymers of a range of degrees of super-activation, apparent pH 5.7, were prepared [similarity] <u>similarly</u> to example 2(a), but varying the percentage of PEG 200.

At page 30, line 17:

[Activity against *Pseudomonas aeruginosa*] <u>Activity against *Pseudomonas aeruginosa*</u>

At page 36, line 23:

Group 1: No treatment (negative control).

At page 36, lines 28-30:

[PCR results of *Helicobacter spp.* using previously optimized genus specific primers where + represents a positive detection of *Helicobacter spp.* and – represents no detection.] PCR results of *Helicobacter spp.* using previously optimized genus specific primers where + represents a positive detection of *Helicobacter spp.* and – represents no detection.

At page 42, line 7:

5) Polymeric antimicrobial 0.2% [2] w/w + Glutaraldehyde 0.025% w/w

At page 43, lines 1-3:

It was shown that the acetal derivative of poly(2-propenal, 2-propenoic acid) was synergistic with Glutaraldehyde, EDTA, and Methyl Paraben, respectively versus [A. niger, C. albicans, E. coli, P. aeruginosa, S. aureus] *A. niger, C. albicans, E. coli, P. aeruginosa, S. aureus*.

At page 43, lines 17-18:

From each test tube 1 mL was subcultured into 9 mL recovery broth and vortexed well (NBT or Sabouraud + Tween 80 [3%] (SABT) or *A. niger*).